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IS 3865 (2001): Beer [FAD 14: Drinks and Carbonated Beverages]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
बीयर — विशिष्टि
(तीसरा पुनरीक्षण)

Indian Standard
BEER — SPECIFICATION
(*Third Revision*)

ICS 67.160.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinks and Carbonated Beverages Sectional Committee had been approved by the Food and Agriculture Division Council.

Alcoholic drinks industry has established itself in India as a well organized industry. Besides meeting the indigenous demand, some quantities of alcoholic drinks are exported and there is considerable potential for developing further exports. The broad objective of this standard is to enable the Indian consumer to get a product of good quality and help in promoting export.

Beer is one of the most common commercially available alcoholic beverage. This standard specifies requirements for beer produced by the alcoholic fermentation of water extract of malted or unmalted cereals or other carbohydrate preparations. Beer should be free from artificial sweetening agents and added alcohol.

This standard was first issued in 1966. Subsequently it was revised in 1978 and in 1993 when four types of beer and star classification depending upon ethyl alcohol content were specified and pH range modified. In this revision, apart from updating its provisions, the provisions of 'Drought beer' have been incorporated.

In the formulation of this standard, due consideration has been given to the provisions of the *Prevention of Food Adulteration Act 1954*, and the Rules framed thereunder; *Standards of Weights and Measures (Packaged Commodities) Rules, 1977* and *State Excise Duty Rules*. However, this standard is subject to the restrictions imposed under these Acts and Rules thereunder, wherever applicable.

The Composition of the Committee responsible for formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BEER — SPECIFICATION

(*Third Revision*)

1 SCOPE

This standard prescribes the requirement and methods of test and sampling for beer.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1070 : 1992	Reagent grade water (<i>third revision</i>)
2091 : 1983	Multi-trip glass beer bottles (<i>second revision</i>)
2346 : 1992	Carbonated beverages (<i>second revision</i>)
3506 : 1989	Tables for alcoholometry (by Pyknometer method) (<i>first revision</i>)
3752 : 1988	Methods of test for alcoholic drinks (<i>first revision</i>)
3753 : 1984	Methods of sampling for alcoholic drinks (<i>first revision</i>)
4467 : 1996	Specification for caramel (<i>second revision</i>)
14348 : 1996	Code for hygienic conditions for alcoholic beverage industry

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Alcoholic Beverage

An alcoholic beverage containing more than 0.5 percent ethyl alcohol by volume.

3.2 Drought Beer

Beer with same types and same ethyl alcohol content as given in 4 and Table 1. Drought beer may or may not be pasteurized.

4 TYPES

Beer shall be of the following four types depending upon the ethyl alcohol content specified in Table 1:

- a) Light,

- b) Standard,
- c) Extra strong, and
- d) Super strong.

5 REQUIREMENTS

5.1 General

Beer shall be the product of alcoholic fermentation of a mash in potable water of malted barley and hops or pellets of hops or hops' concentrates/extracts or hops oil with or without the addition of other malted or unmalted cereals or other carbohydrate sources. Hops substitutes, bitter principles and saponins from any source shall not be used.

Beer shall be free from dirt and foreign matter.

5.2 Freedom from Harmful Ingredients

Beer shall be free from any ingredients injurious to health, chloral hydrate, ammonium chloride, pyridine diazepam and paraldehyde.

5.3 Food Additives

Beer may contain food additives permitted under the *Prevention of Food Adulteration Act, 1954*.

5.4 Freedom from Added Colouring Matter

Beer shall be free from any added colouring matter except caramel produced from sugar. Caramel shall conform to IS 4467.

5.5 Pasteurization

Bottled or canned beer shall be effectively pasteurized.

NOTE — Drought beer may or may not be pasteurized.

5.6 Microbiological Requirements

Beer shall be free from Coliform bacteria and other pathogenic micro-organisms when determined according to the method prescribed in 15 of IS 3752.

5.7 Organoleptic Requirements

Beer shall be clear and shall have characteristic colour, taste and foam of its type.

5.8 Hygienic Conditions

Beer shall be manufactured in premises built and maintained under hygienic conditions (*see* IS 14348).

All equipment shall be clean.

5.9 Beer shall also comply with the requirements given in Table 1.

6 PACKING

6.1 Packing in Bottles or Cans

Beer shall preferably be filled in glass bottles (see IS 2091) or PET bottles or cans as agreed to between the purchaser and the supplier. Bottles or cans shall be properly sealed with gas-tight crown caps. Stainless steel cans shall be used for packing drought beer.

6.2 Packaging of Bottles or Cans

Bottles or cans shall be securely packaged to minimize breakage in wooden cases, corrugated fibreboard boxes, or any other package as agreed to between the purchaser and the supplier.

7 MARKING

7.1 The following particulars shall be marked legibly and indelibly on the label of the container:

- a) Name and address of the manufacturer;
- b) Brand name, if any;
- c) Name and type of the material (including mention of drought beer if applicable) and ethyl alcohol content, percent (v/v), marking 'Pasteurized' if drought beer is pasteurized;
- d) Batch or code number;
- e) Month and year of bottling;
- f) Date, month and year of manufacture in case of drought beer;

- g) Net content; and
- h) Any other markings required under the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977*, and the *Prevention of Food Adulteration Act, 1954* and Rules framed thereunder.

7.2 BIS Certification Marking

The product may also be marked with the BIS Standard Mark.

7.2.1 The use of the Standard mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING

The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in IS 3753.

9 TESTS

9.1 Tests shall be carried out by the appropriate method referred in various clauses and in Table 1.

9.2 Quality of Reagents

Unless otherwise specified, pure chemicals shall be employed in tests, and reagent grade water (see IS 1070) shall be used wherever the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

Table 1 Requirements for Beer
(Clause 5.9)

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to (4)
i)	Ethyl alcohol content, 15° C, percent (v/v), a) Light b) Standard c) Extra strong d) Super strong	above 0.5 to 4.0 above 4.0 to 5.0 above 5.0 to 6.0 above 6.0 to 8.0	Annex A of this standard
ii)	pH	3.8 to 4.5	Annex B of this standard
iii)	Carbon dioxide, percent, (v/v), <i>Min</i>	2.5 Vol	Annex C of IS 2346
iv)	Methyl alcohol content (expressed as g/100 l of Absolute Alcohol), <i>Max</i>	25	Annex C of this standard

ANNEX A

[Table 1, *Sl No. (i)*]

DETERMINATION OF ETHYL ALCOHOL CONTENT

A-1 APPARATUS

A-1.1 Distillation Assembly

The distillate end of the condenser is attached to a 50 ml pipette, suitably shortened at the upper end and attached to the condenser nozzle by means of a rubber tubing. The lower part of this pipette is suitably curved to reach the bottom of the receiver where it is dipped into the minimum quantity of distilled water (*see* IS 1070).

A-1.2 Pyknometer — 25 or 50 ml capacity.

A-1.3 Measuring Flash — 100 ml capacity.

A-1.4 Thermometer — 0 to 50°C.

A-2 REAGENTS

A-2.1 Sodium Hydroxide Solution — Approximately 1 N.

A-3 PROCEDURE

A-3.1 Remove carbon dioxide by transferring sample

to the flask and shaking, gently at first and then vigorously, keeping the temperature of beer at 20 to 25°C. If necessary, remove suspended material by passing the carbon dioxide-free beer through dry filter paper.

A-3.2 Measure a 100 ml sample into the distillation flask and add 50 ml distilled water as well as a few pieces of pumice stone. Collect the distillate in the 100 ml volumetric flask till the volume in the flask nears the mark. Allow the distillate to come to room temperature and make up the volume to 100 ml with distilled water (foaming, which sometimes occurs, may be prevented by adding a small quantity of anti-foam material). For beers containing abnormal acidity, neutralize exactly with sodium hydroxide solution before proceeding with distillation.

A-3.3 Find out the specific gravity of the distillate at a particular temperature, say 15/15°C, with the help of a pyknometer. Obtain corresponding alcohol content, percent by volume from the tables given in IS 3506.

ANNEX B

[Table 1, *Sl No. (ii)*]

DETERMINATION OF pH

B-1 GENERAL

The pH value or hydrogen ion concentration gives the measure of the true acidity of beer.

B-2 APPARATUS

B-2.1 pH-Meter

B-2.2 Thermometer

B-3 REAGENT

B-3.1 Standard Potash Phthalate Buffer Solution

Dissolve 10.211g of well-dried potassium hydrogen phthalate ($\text{KHC}_8\text{H}_4\text{O}_4$) in distilled water and dilute the solution to one litre. Commercial buffers, buffer tablets or crystals may be used, but the solutions should

be fresh.

B-4 PROCEDURE

B-4.1 Standardize the pH-meter to read 4.0 by immersing the electrodes in the standard buffer of pH 4.0, making the adjustment for temperature and asymmetry potential required by the particular instrument in use. Remove the electrodes from the buffer and rinse them with a jet of water from a wash bottle. Immerse them in the beer sample, and after adjusting the pH-meter to the temperature of the beer, read its pH. Rinse the electrodes with distilled water between successive measurement and recheck the pH-meter against the standard buffer at the close of a series of beer pH measurements.

B-4.2 Report the results to the nearest 0.05 pH.

ANNEX C

[Table 1, Sl No. (iv)]

DETERMINATION OF METHYL ALCOHOL CONTENT BY SPECTROPHOTOMETRY

C-1 REAGENTS

C-1.1 Chromotropic Acid Solution (5 Percent w/v)

Weigh accurately about 5g of chromotropic acid sodium salt into a 100 ml beaker. Dissolve in minimum quantity of distilled water. Transfer into a 100 ml volumetric flask and dilute to volume with distilled water.

C-1.2 Potassium Permanganate Solution (3 Percent w/v)

Weigh accurately about 3 g of potassium permanganate into a 100-ml volumetric flask. Dissolve in 15 ml of phosphoric acid and dilute to volume with distilled water.

C-1.3 Standard Methanol Stock Solution (A)

Weigh accurately about 1 g of methyl alcohol into a 100-ml volumetric flask. Dissolve and dilute to volume with distilled water. (10 000 ppm).

C-2 CALIBRATION

Pipette 10 ml of the stock solution 'A' into a 100 ml volumetric flask and dilute to volume with water (B). From this prepare working standards of 20,40,60,80 and 100 ppm solutions by pipetting 2,4,6,8,10 ml of 'B' into a series of 100 ml volumetric flasks and dilute to volume with water. Then dilute all these 20, 40, 60, 80, 100 ppm solutions 5 times (C).

Pipette 1 ml each of the standard solutions (C) into stoppered 50 ml test tubes. Cool the contents in ice bath for five minutes. Add to each test tube 2 ml of potassium permanganate reagent and keep aside for

30 minutes. Now add crystals of sodium bisulfite crystals till it just decolourises. Then add 1 ml of chromotropic acid solution. Mix well, add 15 ml of concentrated Sulphuric acid and mix well again. Heat the reaction mixture in a boiling water bath for 20 minutes at 80°C. Slowly colour develops from violet to red. Then cool the reaction mixture and take the absorbance at 575 nm using 1 cm path length cell.

Plot the absorbance against concentration to get the calibration graph.

C-3 ANALYSIS PROCEDURE

Take 50 ml sample and distill. Collect 40 ml of the distillate into a 50-ml volumetric flask and dilute to volume with distilled water. Then take 1 ml of distillate and dilute to 5 ml.

Take 1 ml of the solution prepared as above and develop the colour as given under calibration graph.

NOTE — Concentration of alcohol is to be maintained below 10 percent in the final sample solution.

Note the absorbance and dilution (if any) and calculate total Methyl Alcohol content in terms of ppm using formula:

$$\text{Methanol, ppm} = \frac{C \times A_1 \times \text{Dilution}}{A_2}$$

where

- C = concentration of Methanol taken, ppm;
 A_2 = absorbance for standard Methanol solution; and
 A_1 = Absorbance of the sample.

ANNEX D*(Foreword)***COMMITTEE COMPOSITION****Drinks and Carbonated Beverages Sectional Committee, FAD 14**

<i>Organization</i>	<i>Representative (s)</i>
Ministry of Defence, New Delhi	MAJ GEN J. K. BHALLA (<i>Chairman</i>)
Agricultural & Processed Food Products Export Development Authority, New Delhi	SHRI PRAVIN GUPTA MS GOWRI SUNDARAM (<i>Alternate</i>)
All India Distillers Association, New Delhi	DR B. K. MAITIN SHRI J. K. SHARMA (<i>Alternate</i>)
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Central Forensic Science Laboratory, New Delhi	SHRI V. N. SEHGAL SHRI V. S. BISARIA (<i>Alternate</i>)
Central Revenues Control Laboratory, New Delhi	CHIEF CHEMIST DEPUTY CHIEF CHEMIST (<i>Alternate</i>)
Coca Cola India, Gurgaon	DR G. M. TEWARI
Confederation of Indian Food Trade & Industry, New Delhi	THE PRESIDENT SECRETARY (<i>Alternate</i>)
Consumer Guidance Society of India, Mumbai	MRS RENU TALWANI SHRI N. G. WAGLE (<i>Alternate</i>)
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Pioma Industries, Ahmedabad	SHRI A. P. KHAMBATTA SHRI ASHOK PACHAURI (<i>Alternate</i>)
Pondicherry Agro Service and Industries Corporation Limited, Pondicherry	SHRI R. GOVINDARAJAN
Pure Drinks Limited, New Delhi	DIRECTOR SHRI P. S. R. K. PRASAD (<i>Alternate</i>)
Shaw Wallace and Co Limited, Hyderabad	DR S. BHATTACHARYA
United Breweries Limited, Bangalore	DR V. P. ANAND
Vasantdada Sugar Institute, Pune	DR S. P. PHADNIS SHRI M. R. SHIVADE (<i>Alternate</i>)
BIS Directorate General	SHRI P. K. SARKAR, Director & Head (FAD) [Representing Director General (<i>Ex-officio</i>)]

Member-Secretary
MS SUNEETI BHASIN
Assistant Director (FAD), BIS

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of ‘BIS Handbook’ and ‘Standards: Monthly Additions’.

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Amendments Issued Since Publication

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